



AT-WL2400

Wireless Access Point

Installation Guide

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TABLE OF CONTENTS

Welcome to Allied Telesyn	iii
AT-WL2400	
Wireless Access Point 1	
Introduction	1
Package Checklist	2
Hardware Description	3
Applications	3
LED Indicators	5
System Requirements	5
Hardware Installation	6
System Configuration	7
Utility Installation (98/Me/NT/2000)	8
Using the AP Management Utility	8
Network Configuration and Planning	18
Network Topologies	18
Troubleshooting	21
Allied Telesyn 802.11b Wireless Products Maximum Distance Table	22
Specifications	23
Terminology	25

Welcome to Allied Telesyn

This guide contains instructions on how to install the AT-WL2400 Wireless Access Point.

Where to Find Web-based Guides

The Allied Telesyn web site at **www.alliedtelesyn.com** provides you with an easy way to access the most recent documentation and technical information for all of our products. All web-based documents relating to this product and other Allied Telesyn products, can be downloaded from the web site in PDF format.

Document Conventions

This guide uses the following conventions:

Note

A note provides additional information.



Caution

A caution indicates that performing or omitting a specific action may result in equipment damage or loss of data.



Warning

A warning indicates that performing or omitting a specific action may result in bodily injury.

Contacting Allied Telesyn Technical Support

You can contact Allied Telesyn technical support online or by telephone or e-mail.

Online Support

You can request technical support online accessing the Knowledge Base at **<http://kb.alliedtelesyn.com>**. You can use the Knowledge Base to submit questions to our technical support staff and review answers to previously asked questions.

Telephone Support

For technical support by telephone, contact Allied Telesyn at one of the following locations:

Americas

United States, Canada, Mexico,
Central America, South America
Tel: 1 (800) 428-4835

Asia

Singapore, Taiwan, Thailand, Malaysia,
Indonesia, Korea, Philippines, China,
India, Hong Kong
Tel: (+65) 3815-612

Australia

Tel: 1 (800) 000-880

France

France, Belgium, Luxembourg,
The Netherlands, Middle East, Africa
Tel: (+33) 0-1-60-92-15-25

Germany

Germany, Switzerland, Austria, Eastern
Europe
Tel: (+49) 30-435-900-126

Italy

Italy, Spain, Portugal, Greece, Turkey, Israel
Tel: (+39) 02-416-3-41

Japan

Tel: (+81) 3-3443-5640

United Kingdom

United Kingdom, Denmark, Norway,
Sweden, Finland
Tel: (+0044) 1-235-442560

E-mail Support

Latin America, Mexico, Puerto Rico, Caribbean, and Virgin Islands

latin_america@alliedtelesyn.com

Europe

support_europe@alliedtelesyn.com

Returning Products

Products for return or repair must first be assigned a Return Materials Authorization (RMA) number. A product sent to Allied Telesyn without a RMA number will be returned to the sender at the sender's expense.

To obtain an RMA number, contact Allied Telesyn's Technical Support at one of the following locations:

North America

Toll-free: 1-800-762-1664

Fax: 1-425-806-1050

Latin America, the Caribbean, and Virgin Islands

Tel: international code + 425-481-3852

Fax: international code + 425-481-3895

Mexico

Toll-free: 800-424-5012, ext 3852

Fax: international code + 425-481-3895

Australia

Toll-free: 1-800-000-880

Fax: +61-2-9438-4966

Europe, Africa, and the Middle East

Tel: +44-1793-501401

Fax: +44-1793-431099

Puerto Rico

Tel: 1-800-424-5012, ext 3852

or

1-800-424-4284, ext 3852

Asia and Southeast Asia

Tel: +65-381-5612

Fax: +65-383-3830

New Zealand

Toll-free: 0800-45-5782

FTP Server

If you need management software for an Allied Telesyn managed device and you know the file name of the software, you can download the software by connecting directly to our FTP server at **<ftp.alliedtelesyn.com>**. At login, enter 'anonymous' as the user name and your e-mail address for the password.

For Sales or Corporate Information

You can contact Allied Telesyn for sales or corporate information at the location below:

Allied Telesyn, Inc.

19800 North Creek Parkway, Suite 200

Bothell, WA 98011

Tel: 1 (425) 487-8880

Fax: 1 (425) 489-9191

Tell Us What You Think

If you have any comments or suggestions on how we might improve this or other Allied Telesyn documents, please fill out the General Enquiry Form at online. This form can be accessed by selecting “Contact Us” from **www.alliedtelesyn.com**.

AT-WL2400

WIRELESS ACCESS POINT

Introduction

Allied Telesyn's AT-WL2400 Wireless Access Point (AT-WL2400) is an 11 Mbps wireless repeater that seamlessly integrates with existing Ethernet networks to support applications such as mobile users or temporary conferences. This solution offers fast, reliable wireless connectivity with considerable cost savings over wired LANs (eliminates long-term maintenance overhead for cabling). Just install enough wireless access points to cover your network area, plug wireless cards into your notebooks or install wireless adapters into your desktops, and start networking.

Use this device in conjunction with Allied Telesyn's Wireless Cards to create an instant network that integrates seamlessly with Ethernet LANs. Moreover, moving or expanding your network is as easy as moving or installing additional access points – no wires!

Package Checklist

The AT-WL2400 Wireless Access Point package includes:

- One AT-WL2400 Wireless Access Point (AT-WL2400)
- One 9 VDC power adapter
- One utility CD
- This User Guide

Please register this product and upgrade the product warranty at www.alliedtelesyn.com.

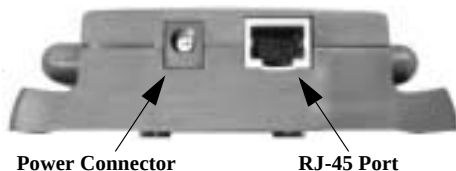
Inform your dealer if there are any incorrect, missing, or damaged parts. If possible, retain the carton, including the original packing materials. Use them again to repack the product in case there is a need to return it.

HARDWARE DESCRIPTION

Allied Telesyn's AT-WL2400 Wireless Access Point serves as a Media Access Control (MAC) bridge between your wired Local Area Network (LAN) and Wireless Local Area Networks (WLANs).

Just attach the access point anywhere along your Ethernet LAN to provide wireless stations within its area of coverage with transparent access to the local wired and wireless LAN.

The AT-WL2400 Wireless Access Point supports an 11 Mbps half-duplex connection to Ethernet networks for each active channel. It is fully compliant with 2.4 GHz DSSS CSMA/CA wireless networking as defined in the IEEE 802.11b standard.



Applications

AT-WL2400 wireless products offer a fast, reliable, cost-effective solution for wireless Ethernet client access to the network in applications such as:

- **Remote access to corporate network information**
E-mail, file transfer, and terminal emulation
- **Difficult-to-wire environments**
Historical or old buildings, asbestos installations, and open areas where wiring is difficult to employ

- **Frequently changing environments**
Retailers, manufacturers, and banks which frequently rearrange the workplace or change locations
- **Temporary LANs for special projects or peak periods**
Trade shows, exhibitions, and construction sites that need a temporary setup. Retailers, airline, and shipping companies that need additional workstations for peak periods. Auditors who require workgroups at customer sites
- **Access to databases for mobile workers**
Doctors, nurses, retailers, or white-collar workers who need access to databases while being mobile in a hospital, retail store, in an office, or on a campus
- **SOHO users**
SOHO (Small Office and Home Office) users who need easy and quick installation of a small computer network

LED Indicators

The AT-WL2400 Wireless Access Point includes three status LED indicators, as described in the following figure and table.



LED		Status	Description
Power (PWR)		On (Red)	Power is being supplied.
Wireless Link	TX	Flashing (Green)	The Access Point is transmitting data through wireless links.
	RX	Flashing (Green)	The Access Point is receiving data through wireless links.
Ethernet	LNK	On (Orange)	Valid Ethernet cable link.
	ACT	Flashing (Orange)	The Access Point is transmitting or receiving data on the Ethernet LAN

System Requirements

Before you install the AT-WL2400 Wireless Access Point, be sure you have met the following requirements:

- An AC power outlet (100~240 V, 50~60 Hz)
- An available RJ-45 (UTP) port on an Ethernet hub or switch
- 802.11b compliant wireless Ethernet adapters with TCP/IP protocols installed

HARDWARE INSTALLATION

1. Select the Site – Choose a location for your AT-WL2400 Wireless Access Point. Usually, the best location is at the center of your wireless coverage area, if possible within line-of-sight of all wireless devices.
2. Place the Access Point in a position that gives it maximum coverage. Normally, the higher you place the antenna, the better the performance.
3. Position the antennas in the desired positions. For more effective coverage, position one antenna along the vertical axis and the other antenna along the horizontal axis (the antennas emit signals along the toroidal plane - and thus provide more effective coverage when positioned along alternate axis).
4. Connect the Ethernet cable – The AT-WL2400 can be wired to an Ethernet network through an Ethernet device such as a hub or a switch using category 3, 4, or 5 UTP Ethernet cable and an RJ-45 connector.
5. Connect the power cable – Connect the power adapter cable to the 9 VDC power socket on the rear panel.

Warning: Use only the power adapter supplied with the AT-WL2400.

SYSTEM CONFIGURATION

Your AT-WL2400 is a plug and Play device. This means that, in most cases, you will not need to configure it.

The AT-WL2400 Access Point includes an SNMP agent that is accessible through an SNMP manager application (AT-WL2400 Wireless AP Manager.) The SNMP agent supports read-write and read-only modes.

The CD labeled “Support Files” contains a utility program for the AT-WL2400 Wireless Access Point.

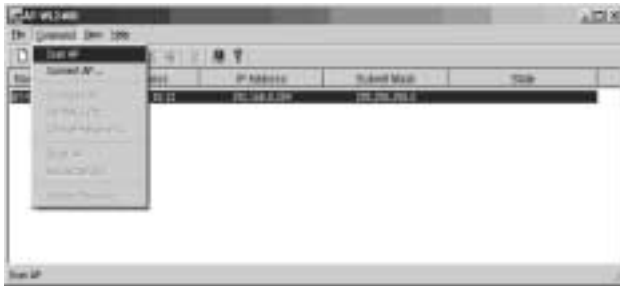
The AT-WL2400 can be configured over an Ethernet network. Connect the AT-WL2400 to a network device such as a hub or switch. Install and run the utility program as described in the following section.

Utility Installation (98/Me/NT/2000)

1. Insert the AT-WL2400 utility disc into the CD-ROM drive on your PC, and then browse to the WL2400 directory on the CD. Double-click 'setup.exe'. (Follow the on-screen instructions to install the utility program.)

Using the AP Management Utility

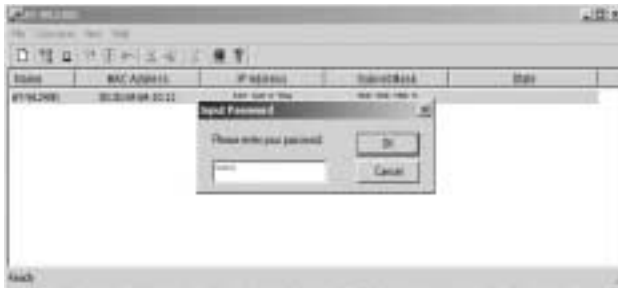
1. Click "Start/Program Files/AT-WL2400/AT-WL2400." Click "Command" and then select "Scan AP" from the menu. The program will then detect all Access Points on the network.



Note: For proper communication with the AT-WL2400, insure your system is configured on the same IP subnet as the AP. See page 16 for default IP address and subnet mask .

2. From the list of detected AT-WL2400s, double-click on the unit you wish to configure. A dialogue box will prompt you for the login password.

USING THE AP MANAGEMENT UTILITY



3. Enter the default password: atilan.
4. Click the “Command” main menu item.



Configure AP

The **Configure AP** screen displays the AP status and settings. The screen is divided into two sections. The first section is read-only.



BSS ID - Media Access Control address

Regulation Domain - Countries have different regulations regarding the use of radio frequencies

WEP - WEP (Wired Equivalent Privacy) Enabled/Disabled status

Associated Stations - Number of wireless clients

Firmware Version - Current firmware version

AP Name - Set your Access Point alias name (Default: AT-WL2400)

SSID - Clients in your network must use the same value entered here (Default: atlan)

Channel - Set the operating radio channel number (Default: 11)

Note: Available channel settings are limited by local regulations which determine which channels are available (FCC/IC: 1-11, ETSI: 1-13, France: 10-13, Spain: 10-11, MKK: 1-14)

RTS Threshold - Set the RTS Threshold to enable the RTS/CTS mechanism. (Default: 2,346 which means Disabled)

Accept “ANY” SSID - Checking this box enables the Access Point to accept the association of wireless clients using “ANY” as their SSID. If this feature is disabled (the box is not checked), the wireless clients must use the same SSID as the Access Point (thus enhancing security)

IP Address - Set the IP address as required (Default: 192.168.0.254)

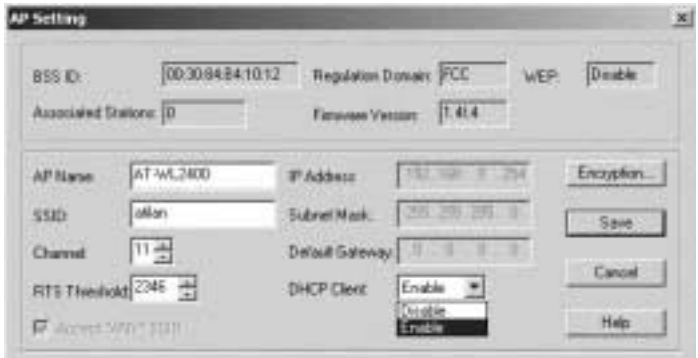
Subnet Mask - Set the Subnet Mask as required (Default: 255.255.255.0)

Default Gateway - Set the default gateway as required (Default: 0.0.0.0)

DHCP Client - You can enable the DHCP Client function to automatically get an IP Address, Subnet Mask, and Default Gateway from a DHCP server in your network (Default: Enabled)

SYSTEM CONFIGURATION

Note: If a DHCP server does not exist in your network, then the Access Point will automatically use the values in the IP Address field.



Encryption - Click the “Encryption” button to setup WEP security



WEP - Wired Equivalent Privacy (WEP) is implemented in this device to prevent unauthorized access to your wireless network and provide more secure data transmissions. The higher the number of bits in the encryption key, the higher the level of security. All clients in the wireless network must have the same WEP setting (Default: Disabled)

Create with Passphrase - The security key for WEP encryption is generated from your Passphrase string, so it must be the same on all clients in your network

Manual Entry - Allows manual entry of security keys. (2 Hexadecimal digits in each block, A~F & 0~9)

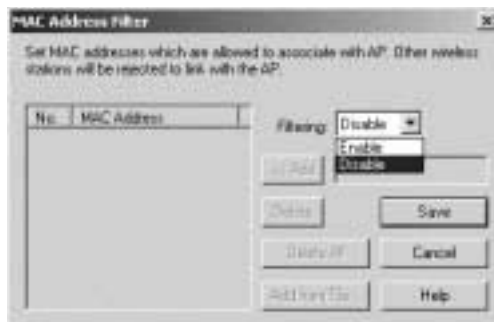
Key 1~4 - Each 64-bit Key ID contains 10 HEX digits but 128-Bit encryption has only 1 Key which contains 26 HEX digits. All wireless devices must have the same Key ID element values to communicate

Default Key ID - Choose the Key ID that has the encryption string you prefer. If using a key generated from a Passphrase, you must use the same Passphrase and key on each station

Set MAC Filter

In the **Set MAC Filter** screen, you can decide which wireless devices are allowed to connect to the Access Point by adding the MAC address of allowed clients. Wireless devices that are not in the table will be denied access.

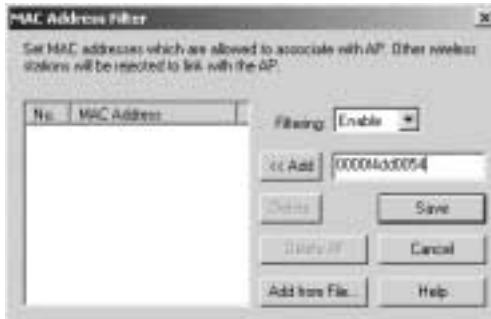
Filtering - Choose “Enabled” to enable the MAC Filter (Default: Disabled)



SYSTEM CONFIGURATION

Key in the MAC addresses of Ethernet devices you wish to allow to associate with the AP.

Note: The format is 12 Hexadecimal digits. e.g. 0090D112AF89.



Click “Add” and then click “Save” to save the changes.

Otherwise, click “Add from File..” to add a previously saved text file of MAC addresses and click “Save” to save the changes.

Note: The table allows you to enter a maximum of 64 MAC addresses.

Change Password

A password is required to configure the AT-WL2400. Changing the password from the default value to a value of your choice will improve network security. On the “Change Password” screen you may change the password on the Access Point.



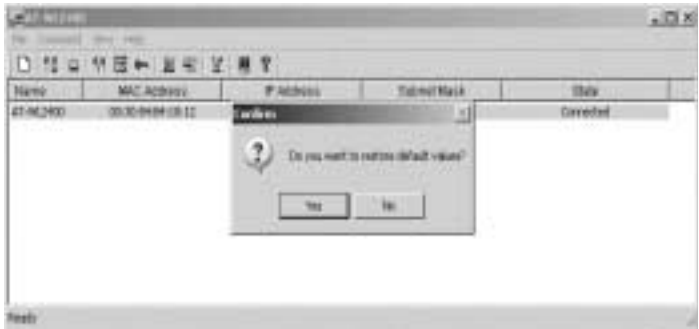
Reset AP

The “Reset AP” screen will let you reboot the Access Point.



Reload Default

The “Reload Default” screen will let you reload the factory default settings.



The table below lists the default values.

Setting	Default Value
AP Name	AT-WL:2400
SSID	atilan
Channel	11
RTS Threshold	2346
IP Address	192.168.0.254
Subnet Mask	255.255.255.0
Default Gateway	0.0.0.0
DHCP Client	Enabled
Encryption	Disabled
MAC Address Filter	Disabled
Password	atilan

Update Firmware

The “Update Firmware” screen allows you to upgrade the firmware of the Access Point.



Enter the file name or browse for the file containing the updated firmware.

NETWORK CONFIGURATION AND PLANNING

Allied Telesyn's AT-WL2400 Wireless Solution supports a stand-alone wireless network configuration, as well as an integrated configuration with 10 Mbps Ethernet LANs. For a list of the maximum distances between the AP and wireless clients, refer to page 22.

The Allied Telesyn wireless network cards and adapters can be configured as:

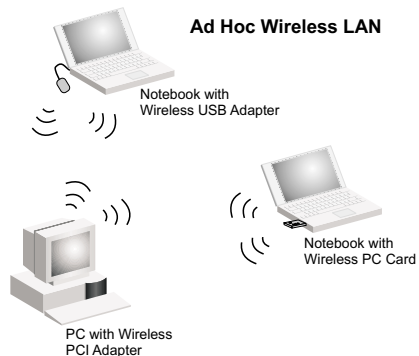
- Ad hoc – for small departmental or SOHO LANs
- Infrastructure – for enterprise LANs

Network Topologies

Ad Hoc Wireless LAN

An ad hoc wireless LAN consists of a group of computers, each equipped with a wireless adapter, connected via radio signals as an independent wireless LAN. Computers in a specific ad hoc wireless LAN must be configured to the same radio channel.

An ad hoc wireless LAN can be used for a small branch office or SOHO operation.

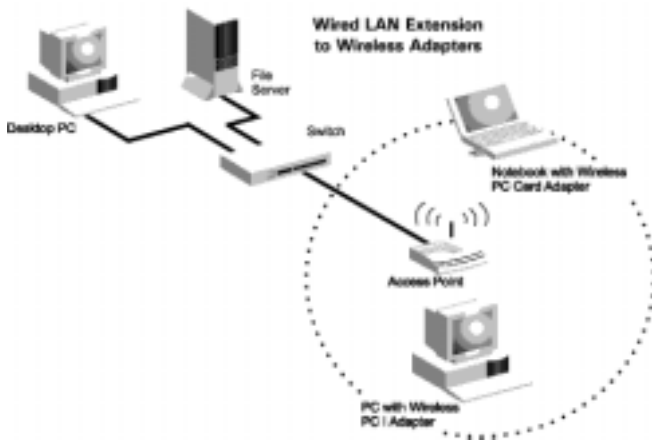


Infrastructure Wireless LAN

An integrated wired and wireless LAN is called an Infrastructure configuration. A Basic Service Set (BSS) consists of a group of wireless PC users, and an access point that is directly connected to the wired LAN. Each wireless PC in this BSS can talk to any computer in its wireless group via a radio link, or access other computers or network resources in the wired LAN infrastructure via the access point.

The infrastructure configuration permits wireless clients to access the wired LAN and also increases the effective wireless transmission range for wireless clients as their signal can be passed through multiple access points.

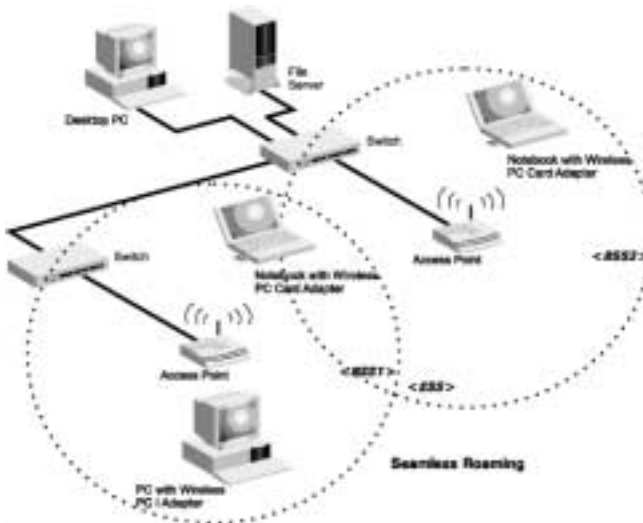
A wireless infrastructure can be used for access to a central database, or for connection between mobile workers, as shown in the following figure.



Infrastructure Wireless LAN for Roaming Wireless PCs

The Basic Service Set (BSS) is the communications domain for each Wireless Access Point. For wireless PCs that do not need to support roaming, set the domain identifier (SSID) of the wireless card to the BSS ID of the Access Point to which you want to connect. Check with your administrator for the BSS ID of the Access Point to which he wants you to connect.

A wireless infrastructure can also support roaming for mobile workers. More than one Access Point can be configured to create an Extended Service Set (ESS). By placing the Access Points so that a continuous coverage area is created, wireless users within this ESS can roam freely. All Allied Telesyn wireless network cards, adapters, and AT-WL2400 Wireless Access Points within a specific ESS must be configured with the same SSID.



TROUBLESHOOTING

Check the following items before you contact Allied Telesyn Technical Support.

1. If mobile users do not have roaming access to the AT-WL2400 access point:

Make sure that all the AT-WL2400s and stations in the ESS in which the 'atilan' mobile users can roam are configured to the same WEP setting, SSID, and authentication algorithm.

2. If the management utility cannot connect to the AT-WL2400:

Check that your local IP address settings conform to the AT-WL2400 settings.

3. If you forgot your password or your AT-WL2400 has locked up, you can reset it to factory defaults by performing the following steps:

- Start the utility program.
- On the main menu, click "Command." Click "Reload Default."

or

- Power off the AT-WL2400.
- Use a pin to push in the reset button located on the bottom of the AT-WL2400 (marked "Reload.")
- While holding in the button, apply power to the AP.
- The AP will begin to load the default settings.
- Wait for about 5 seconds. Release the button.
- The AP will restart with the factory default settings.

Allied Telesyn 802.11b Wireless Products Maximum Distance Table

Important Notice

Maximum distances posted below are actual tested distance thresholds. However, there are many variables such as barrier composition and construction, and local environmental interference that may impact your actual distances and cause you to experience distance thresholds far lower than those we post below.

Allied Telesyn 802.11b Wireless Products Maximum Distance Table				
	Speed and Distance Ranges			
Environmental Condition	11 Mbps	5.5 Mbps	2 Mbps	1 Mbps
Open Environment: A line-of-sight environment with no interference or obstruction between AP and users.	180 m (591 ft)	300 m (984 ft)	450 m (1476 ft)	550 m (1804 ft)
Semi-Open Environment: An environment with no major obstructions such as walls or privacy cubicles between the AP and users.	50 m (164 ft)	70 m (230 ft)	90 m (295 ft)	120 m (394 ft)
Closed Environment: A typical office or home environment with floor to ceiling obstructions between the AP and users.	25 m (82 ft)	35 m (115 ft)	45 m (148 ft)	55 m (180 ft)

SPECIFICATIONS

Model: AT-WL2400

Maximum Channels

USA & Canada: 11, Europe (ETSI): 13

Maximum Clients

64

Operating Range

Maximum distance at 11 Mbps: 180 m (591 ft)

Maximum distance at 5.5 Mbps: 300 m (984 ft)

Maximum distance at 2 Mbps: 450 m (1476 ft)

Maximum distance at 1 Mbps: 550 m (1804 ft)

Cell Separation (for roaming clients)

60 m (197 ft) between access points

Data Rate

1, 2, 5.5, 11 Mbps per channel

Network Configuration

LAN to access point to wireless card

Access point to wireless card

Operating Frequency

USA, Canada: 2.400-2.4835 GHz

Europe (ETSI): 2.400-2.4835 GHz

Sensitivity

1, 2, 5.5 Mbps: -82 dBm

11 Mbps: -78 dBm typical

Modulation

CCK, BPSK, QPSK

Power Supply

Input: 100-240 AC, 50-60 Hz

Output: 9 VDC, 1A

Output Power

>+15dBm minimum

Physical Size

13.74 x 10.8 x 3.01 cm (5.41 x 4.25 x 1.19 in)

Weight

210 g (7.4 oz)

LED Indicators

Power, Ethernet Link/Activity,

Wireless Activity

Network Management

Windows 98/Me/NT/2000 SNMP Management Utility

Operating System Compatibility

Windows 98/Me/NT/2000

Encryption

64-bit/128-bit WEP

Temperature

Operating: 0 to 50°C (32 to 122°F)

Storage: 0 to 70°C (32 to 158°F)

Humidity

5% to 85% (non-condensing)

Compliances

CE Mark

EN55022 Class B

EN55024

IEC 61000-42/3/4/6/11

Emissions

FCC Class B

ETS 300 328

RCR STD-33A

Safety

CSA/NTRL (CSA 22.2 No. 950 & UL 1950)

EN60950 (TüV/GS)

Vibration/Shock/Drop

IEC 68-2-34/IEC 68-2-32

Standards

IEEE 802.3 10BASE-T, IEEE 802.11b

Warranty

Limited Lifetime

TERMINOLOGY

The following is a list of terminology that is used in this document.

Access Point – An internetworking device that seamlessly connects wired and wireless networks.

Ad Hoc – An ad hoc wireless LAN is a group of computers each with LAN adapters, connected as an independent wireless LAN.

Backbone – The core infrastructure of a network. The portion of the network that transports information from one central location to another central location where it is unloaded onto a local system.

Base Station – In mobile telecommunications, a base station is the central radio transmitter/receiver that maintains communications with the mobile radio telephone sets within its range. In cellular and personal communications applications, each cell or micro-cell has its own base station; each base station in turn is interconnected with other cells' bases.

BSS – BSS stands for “Basic Service Set.” It is an Access Point and all the LAN PCs that are associated with it.

CSMA/CA – Carrier Sense Multiple Access with Collision Avoidance.

ESS – ESS (ESS-ID, SSID) stands for “Extended Service Set.” More than one BSS is configured to become an Extended Service Set. LAN mobile users can roam between different BSSs in an ESS (ESS-ID, SSID).

Ethernet – A popular local area data communications network, which accepts transmission from computers and terminals. Ethernet operates on a 10 Mbps baseband transmission rate, using a shielded coaxial cable or shielded twisted pair telephone wire.

Infrastructure – An integrated wireless and wired LAN is called an Infrastructure configuration.

Roaming – A wireless LAN mobile user moves around an ESS and maintains a continuous connection to the Infrastructure network.

RTS Threshold – Transmitters contending for the medium may not be aware of each other. RTS/CTS mechanism can solve this “Hidden Node Problem.” If the packet size is smaller than the preset RTS Threshold size, the RTS/CTS mechanism will NOT be enabled.

WEP – “Wired Equivalent Privacy” is based on the use of 64-bit or 128-bit keys and the popular RC4 encryption algorithm. Wireless devices without a valid WEP key will be excluded from network traffic.